Unit D: Our Genes, Our Selves Table of Contents

My Table Group for Unit D

Name (1st and Last)	Phone #	Email

Activity #55 Plants Have Genes Too!

Table Answer: **How are traits inherited?**

Table Answer: **Think about some inherited traits that you have that your parents don't? How is that possible? For example, Joe can't tongue roll but his parents can.**

Challenge Question:

Evidence:
Copy the pictures of the plant generations on page D-10 on pg _____.

Activity #55 Analysis question (echo the question)
1. Record your prediction for the color or colors of the plants that will grow from the seeds. You may make more than one prediction, but be sure to indicate which you think is most likely to happen. Be as specific as possible.
2. What are your reasons for each prediction you proposed for Question 1? Explain.

Activity #62 Analyzing Genetic Data

Challenge Question:

Initial Thoughts:

Evidence:

Table #	# _____	# _____	Total Plants
1			
2			
3			
4			
5			
6			
7			
8			
Class Totals			

Activity #62 Analysis Questions:
4. When you placed your 10 seeds in your Petri dish two weeks ago, you were told that they were all the offspring of two green parent plants. You were also told that each of these two green parents had one green parent and one yellow parent.
a. What was the **class** ratio of green to yellow? (Round to the nearest whole number like you did in Activity #59)
b. What was the **national** ratio of green to yellow? (Round to the nearest whole number like you did in Activity #59)
c. Based on the **national** results, what can you conclude about the color alleles of each of the green parents of your seedlings?

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Activity #56 Joe's Dilemma

Challenge Question:

Initial Thoughts:

Evidence:
List here at least 2 questions you think Joe should ask Dr. Foster before he decides whether to be tested.

1. _____
   _____
2. _____
   _____
3. _____
   _____

Genetic Testing	
Advantages	*Disadvantages*

Analysis Questions (echo the question)

1. What are the signs that suggest a person may have the Marfan syndrome?
2. What causes the Marfan syndrome? Be Specific.
3. Can you "catch" the Marfan syndrome from another person, the way you catch the flu? Explain.
4. What effect can the Marfan syndrome have on a person's life?
5. Look back at the questions you wrote in your Science Notebook for Step 2 of the Procedure.
   a. Were any of your questions answered? Record the new information you learned from the video.
   b. What new questions would you want to ask a doctor or a genetic counselor?

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples and/or information from the reading and/or class discussion to help explain your answer.

Activity #57 Copycat

Challenge Question:

Initial Thoughts:

Evidence:
STT #1, #2, #3, #4 on pg ____.
Make a Table like the following on pg ____.

Reproduction		
Asexual	**Sexual**	**Cloning**

Classify each of the following as either sexual or asexual reproduction. Explain each answer.

	Sexual or asexual	Explanation (Explain why you know it is sexual or asexual reproduction)
a. An orange cat is mated with a black cat, in hopes of producing a tortoiseshell cat.		
b. A cutting is taken from a red-flowered geranium and placed in water to develop roots. Once roots have grown, the new plant is placed in soil and grows to produce another re-flowered geranium.		
c. A red-flowered geranium with dull leaves is bred with a white-flowered geranium with shiny leaves, with a goal of producing a red-flowered geranium with shiny leaves.		
d. A male fish releases sperm cells into the water. One of the sperm cells unites with an egg from a female fish to form a new cell that grows into a new fish.		
e. A small worm that lives in water splits in two and each half grows to normal size. The head end grows a tail, and the tail end grows a head.		
f. Sheep reproduce only by sexual reproduction in nature. Using modern technology, a clone of an adult sheep is produced.		

Analysis Questions:

1. If you were given an opportunity to clone yourself, would you do it? Explain. (Give **at least 3 reasons** why you would or would not)

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples and/or information from the reading and/or class discussion to help explain your answer.

Activity #58 Creature Features

Challenge Question:

Initial Thoughts:

Evidence:

Sky and Poppy's family tree, see pg ____.

STT#1: What do you think the tails of Skye and Poppy's offspring will look like?

STT #2
Hypothesis #1: _____

Hypothesis #2: _____

Hypothesis #3: _____

STT#3 Does the evidence so far from the second and third generation help you rule out any of the hypothesis? Explain.

Analysis Questions:
1. Based on the breeding results and your simulations, which hypothesis do you think best fits the evidence? **Explain** your answer.

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Activity #59 Gene Combo

Challenge Question:

Initial Thoughts:

Evidence:

Capital letters represent _____genes. The letter is chosen by…

Lowercase letters represent _____genes.

Table 1: Gene Combo Results

Offspring	Ocean's contribution (T or t?)	Lucy's Contribution (T or t?)	Offspring's genes (TT, Tt, tT, or tt?)	Offspring's tail color (blue or orange?)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Table 2: Group Summary of your Results see page ____.

Analysis Questions:

1. What is the ratio of blue-tailed to orange tailed critter pups? Use the class data to answer this question.
   a. Divide the number of blue-tailed offspring by the number of orange-tailed offspring.

   Ratio of tail colors= number of blue-tailed offspring = _____ = ____
   number of orange-tailed offspring
   b. Round this value to the nearest whole number. Then express it as a ratio by writing it like this?
   _____ : 1
   (whole number
   c. Express this ratio as a pair of fractions, so that you can use them to complete the following sentence:
   "About ____ of the offspring have blue tails, and about____ of the offspring have orange tails."
   d. Explain why the class obtained such a large ratio.

4. Look back at Activity 58 "Creature Features". Do the results of the coin-tossing model match the generation three critter data? Explain. If they do not match, explain possible reasons for this

Summary:

1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Activity #60 Mendel, First Geneticist (Part 1 and Part 2)

Part 1: The Flower

Challenge Question:

Initial Thoughts:

Evidence: **The parts of a flower** (Draw color and label your flower. Use page 393 to help you label)

Label:
- Stamen
- Anther
- Filament
- Stigma
- Style
- Ovary
- Pistil
- Sepal
- Petal

Your flower: **# of sepals** = _____
# of petals = _____
# of stamens = _____

Label:
-ovary
-egg

Label:
_____
_____

Specimen: _____
Magnification: _____

Specimen: _____
Magnification: _____

Part 1 Analysis Questions: (Answer each question in a complete sentence) Use **pg 393-395** to help answer these questions.

1. What is the male reproductive part of a flower? Name the two parts and the function of each part.
2. What is the female part of a flower called? Name the 3 parts and the function of each part.
3. What is inside the ovary?
4. Based on your observations, describe how the petals, pistils, sepal, and stamen of a flower are arranged.
5. How do you think the flower you examined is pollinated? Use your observations, including the height of the pistil and stamens, to support your answer.

Part 1 Summary:

After completing this activity, my improved or extended answer to the challenge question is….

Specific evidence that supports my answer includes ….. (Cite data and information from the actual activity and Evidence section)

Part 2: Mendel

Challenge Question:

Evidence:

STT #1, #2a, #2b, and #3 on pg _____.

Part 2 Analysis Questions:

1. Based on Mendel's results, what trait for each pea characteristic is dominant? Calculate to the hundredths place the ratio of dominant to recessive for each characteristic in the third generation. Record the **ratio** for each characteristic in the table below.

Characteristic	Dominant Trait	Recessive	Ratio
Flower Color			
Seed Color			
Seed Surface			
Pod Color			

2b. Why are the ratios (in the table for Question #1) not exactly 3:1?

3. Look at Figure 1, which shows the ratio of green-seeded and yellow-seeded offspring. Explain why a 1:3 ratio of green-seeded plants to yellow-seeded plants is the same as a fraction of ¼ green-seeded plants.
4. Mendel performed his experiments on more characteristics than the four shown in Figure 1. Why was it important for him to look at more than one characteristic?

Part 2 Summary:

After completing this activity, my improved or extended answer to the challenge question is….

Specific evidence that supports my answer includes ….. (Cite data and information from the actual activity and Evidence section)

Activity 61 Gene Squares

Challenge Question:

Initial Thoughts:

Background Notes:

	Alleles	Homozygous/ Purebred	Heterozygous/ Hybrid	Genotype	Phenotype
What is it?					
Example					

Evidence:

Punnett Squares—Step by Step

The cross between the Generation 2 (Tt) critters Ocean and Lucy is:

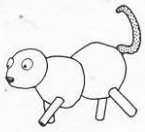
Ocean x Lucy

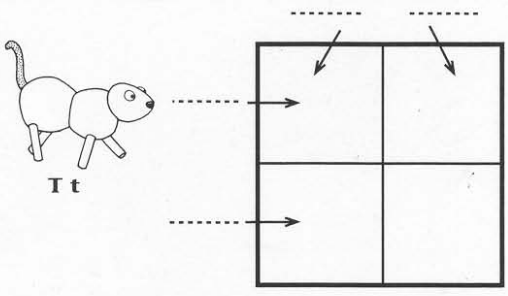
Tt x Tt

T = allele for blue tail color (dominant)
t = allele for orange tail color (recessive)

Note that while Ocean and Lucy both have blue tails, they are both heterozygous.

1. Referring to the example above from your book, complete this Punnett square for the cross between Ocean and Lucy.
   - **a.** Place Ocean's and Lucy's alleles on the dotted lines in the Punnett square.
   - **b.** Complete the Punnett square by filling in each box with the allele above it and the allele to its left.

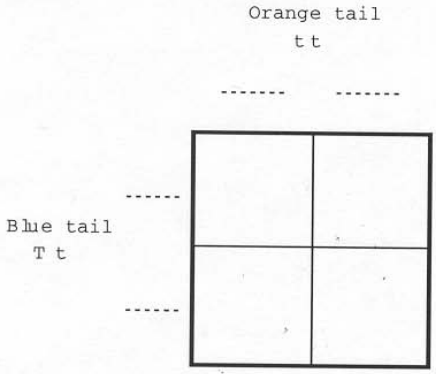




   - **c.** Use either a blue pencil or a regular pencil to shade in the squares for offspring that will have blue tails in your Punnett square above.
   - **d.** About what **fraction** of the offspring of Ocean and Lucy are predicted to have blue tails, according to the Punnett square?
   - **e.** About what **fraction** are predicted to have orange tails?

Generation 3 includes some critters with orange tails and some with blue tails.

2. Complete this Punnett square for a cross between an orange-tailed critter and a heterozygous blue-tailed (Tt) critter.

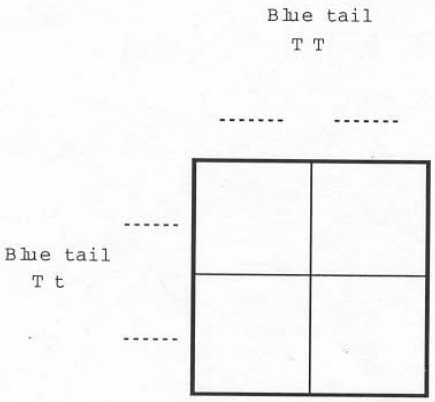


a. Use pencil to shade in the squares for offspring with blue tails.

b. About what **fraction** of the offspring are predicted to have blue tails?

c. About what **fraction** are predicted to have orange tails?

3. Complete this Punnett square for a cross between a homozygous blue-tailed (TT) critter and a heterozygous blue-tailed (Tt) critter



a. Use pencil to shade in the squares for offspring with blue tails.

b. About what **fraction** of the offspring are predicted to have blue tails?

c. About what **fraction** are predicted to have orange tails?

Analysis Questions:

1. Compare the results of your Punnett square for problem 1 with the results of the Ocean/Lucy cross in Activity 59, “Gene Combo”. Why are they similar?

2. Refer to the table of Mendel's results in Activity 60, "Mendel, First Geneticist," on page D-36.
    a. What are the traits for pea flower color? Suggest letters you might use to represent the alleles for flower color.

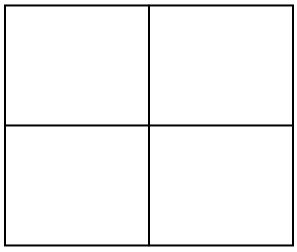
    b. What are the traits for seed surface? Suggest letters you might use to represent the alleles for seed surface.

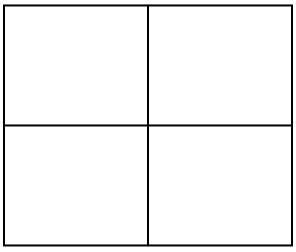
3. Look over the work on pages 32 and 33. Why is it impossible for offspring to show the recessive trait if one parent is homozygous for the dominant trait?

4. A scientist has some purple-flowered pea plants. She wants to find out if the pea plants are homozygous for the purple flower color.
    a. What cross will be best to find out if the purple-flowered peas are homozygous? Why?

    b. Use a Punnett square to show what will happen if the plants are crossed with white-flowered plants and the **purple-flowered plants do not have** an allele for the white trait

    c. Use a Punnett square to show what will happen if the plants are cross with white flowered plants and the **purple-flowered plants** do have an allele for the white trait.



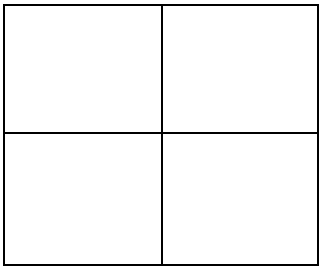


Summary:

1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Punnett Square Practice

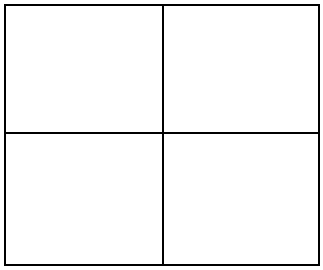
1. In silkworms, the dominant allele for cocoon color is yellow (Y), and the recessive allele is white cocoon (y). If two parents with the genotypes YY and yy are crossed, what will be all the possible genotypes and phenotypes of the offspring?



Phenotype of offspring

Genotype of offspring

2. In mice, the dominant allele for eye color is black (B), and the recessive allele is red eyes (b). If two heterozygous parents are crossed, what will be all the possible genotypes and phenotypes of the offspring?



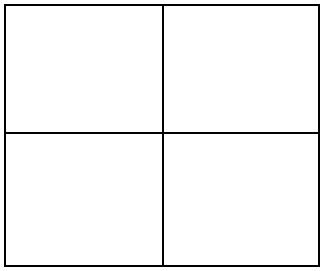
Phenotype of offspring

Genotype of offspring

3. Yellow is dominant to green in seed color in pea plants. What are the phenotypes of the following genotypes?

Homozygous recessive:
Heterozygous:
Homozygous dominant:

4. Complete Punnett Square to show the genotypes of the offspring of a cross between two pea plant parents that are heterozygous for tall plants. Use a capital "T" for tall and lower case "t" for short. Tall is dominant.



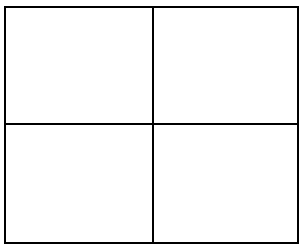
Phenotype of offspring

Genotype of offspring

a. What percent of the offspring will be homozygous dominant?
b. What percent of the offspring will be heterozygous?
c. What percent of the offspring will be homozygous recessive?

5. A hybrid(heterozygous) plant for inflated pod shape was crossed with a plant with pinched shaped pods. If pinched is recessive to inflated, what are the possible genotypes and phenotypes of the offspring? What is the probability the offspring will be pinched? _____

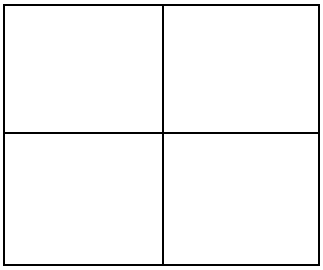
Phenotype of offspring



Genotype of offspring

Punnett Square Practice

6. In purple-people-eaters, one-horn is dominant and no horns is recessive. Draw a Punnet Square showing the cross of a purple people eater that is hybrid for horns with a purple people eater that does not have horns. Summarize the genotypes & phenotypes of the possible offspring.



Phenotype of offspring

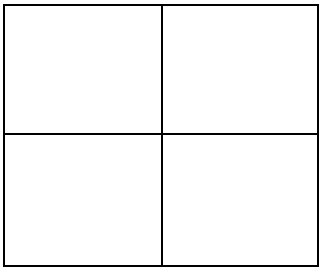
Genotype of offspring

7. Let's say that in seals, the gene for the length of the whiskers has two alleles. The dominant allele (W) codes long whiskers & the recessive allele (w) codes for short whiskers.

a) What percentage of offspring would be expected to have short whiskers from the cross of two long-whiskered seals, one that is homozygous dominant and one that is heterozygous? _____
b) If one parent seal is pure long-whiskered and the other is short-whiskered, what percent of offspring would have short whiskers? _____

8. A green-leafed luboplant (*I made this plant up*) is crossed with a luboplant with yellow-striped leaves. The cross produces 185 green-leafed luboplants. Summarize the genotypes & phenotypes of the offspring that would be produced by crossing two of the green-leafed luboplants obtained from the initial parent plants.

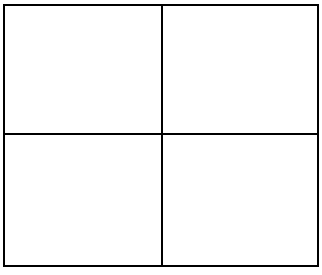
9. Mendel found that crossing wrinkle-seeded plants with pure round-seeded plants produced only round-seeded plants. What genotypic & phenotypic ratios can be expected from a cross of a wrinkle-seeded plant & a plant heterozygous for this trait (seed appearance)?



Phenotype of offspring

Genotype of offspring

10. In four o'clock plants, the dominant allele for flower color is red (F), and the recessive allele is white flowers (f). Flower color in four o'clock plants is also a incomplete dominance, which means when the organism is heterozygous (Ff), the dominant and recessive allele blend to make pink. If one white flowered plant and one pink flowered plant are crossed, what will be all the possible genotypes and phenotypes of the offspring?



Phenotype of offspring

Genotype of offspring

Activity 63 Show me the Genes!

Challenge Question:

Initial Thoughts:

Evidence:

STT #1 Cell Division	Unicellular Organism	Multicellular Organism
Cell Division Function		

STT #2, #3, #4, #5 on pg ____.
Figure 3: Cell Division in more detail (Mitosis) (draw, color and label the illustration from your book) on pg ___. Leave room for some notes.
Figure 6: Sex cell and Fertilization (draw, color and label the illustration from your book) on pg ___.
View: What is Heredity (GSLC)

Comparison Matrix: Mitosis vs. Meiosis		
Characteristic	**Mitosis**	**Meiosis**
# of cells made		
# of chromosomes in cells that are made (same, half, quarter, etc)		
type of cell it happens to (body cell or sex cell)		
resulting cell identical to parents cell? (Yes or No)		
where does it happen in the body?		
# of divisions		
Purpose		

Analysis Questions:
1. Draw a flow diagram (a series of pictures) (use page 176-177 in your PH textbook for help) that show the location and relative sizes of DNA, genes, chromosomes, and cells. Start with a cell and work smaller.
2. Write a paragraph to explain your diagram that your drew in question #1.

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples and/or information from the reading and/or class discussion to help explain your answer.

Activity: Making a Karyotype

Challenge Question:

Initial Thoughts:

Evidence: A karyotype is an organized profile of a person's _____. In a karyotype, chromosomes are arranged and numbered by _____, from largest to smallest. This arrangement helps scientists quickly identify chromosomal _____ that may result in a _____.

To make a karyotype, scientists take a picture of someone's chromosomes, cut them out and match them up using _____, _____ and _____ as guides.

(Fold your Karyotype in half and Paste one half of the page here)

Analysis Questions:

1. How many chromosomes does a human have in each cell, total? ____
2. How many ***different*** kinds of chromosomes does a human have? _____
3. Use the following three words in a sentence, and show their relationship to each other: chromosome, gene, DNA.

Summary:

1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Activity: Chromosome Mix-up

Challenge Question: How are two parents' genes combined to produce an offspring's traits? How is meiosis involved?

Initial Thoughts:

→Note: You will earn ___ points for keeping track of all of your materials throughout the activity.

Procedure:

1. Starting with chromosome number 1, both partners pick up their chromosome and let it drop onto the table from a height of 2-3 feet.
2. For each pair of chromosomes, determine the genotype for each trait and record it in your data table.
3. Use the traits key to determine the phenotype for each trait and fill it into your data table. Also, mark whether the offspring is homozygous or heterozygous for that characteristic.
4. Continue steps 1-3 with chromosomes 2-23. (Chromosome 23 is the one with X's or Y's).
5. On the next blank page in your notebook, neatly draw and color the baby that was produced based on the genes that it received. Use the entire page.

Evidence:

Characteristic	Denoted by Letter	Genotype	Phenotype	Heterozygous	Homozygous
Sex	X and Y				
Face Shape	R				
Chin Shape	S				
Cleft Chin	C				
Skin Color	A				
Hair Color	H				
Eye Color	FB				
Red Hair	G				
Hair type	W				
Widows Peak	P				
Eyebrow Thickness	T				
Eyebrow Placement	E				
Distance between eyes	O				
Eye Size	I				
Eye Shape	V				
Eyelashes	M				
Mouth Size	Q				
Lip Thickness	J				
Dimples	K				
Nose Size	N				
Nose Shape	U				
Ear Lobe Attachment	Z				
Hairy Ears	D				
Freckles on Cheeks	L				
Freckles on Forehead	@				

Analysis Questions:

1. What is a genotype? Give an example.

2. In your example for question #1, did you give a heterozygous or a homozygous genotype?

3. What is a phenotype? Give an example.

4. Use the terms dominant and recessive to explain why your child ends up with dimples whether it is KK or Kk, but not if it is kk.

5. Which trait or traits display incomplete dominance? Explain.

6. Explain how the sex of a baby is determined differently than all of the other traits.

7. When a trait is determined by more than just one set of genes it is called polygenic inheritance. Which characteristics displayed polygenic inheritance? List them all.

8. What is the name of the process used to create egg and sperm cells so that only half of your chromosomes end up in egg or sperm cells? What part of the activity demonstrated this action?

9. Explain how meiosis, followed by fertilization, followed by mitosis leads to a child with trillions of cells which each contain exactly 46 chromosomes.

Summary:

After completing this activity, my improved or extended answer to the challenge question is….

Specific evidence that supports my answer includes ….. (Cite data and information from the actual activity and Evidence section)

Activity #65 Breeding Critters-More Traits

Challenge Question:

Initial Thoughts:

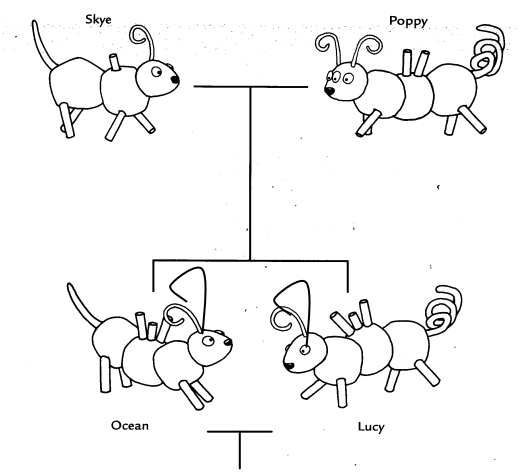
Evidence:

Critter Breeding Worksheet

Trait	Ocean's Alleles		Offspring's Genes		Offspring's Trait	Lucy's Alleles	
	Heads	Tails	From Ocean	From Lucy	(Use Critter Code to fill this in)	Heads	Tails
1. Body segments	B	b				B	b
2. Legs	L	l				L	l
3. Eyes	E	e				E	e
4. Nose	N	n				N	n
5. Tail color	T	t				T	t
6. Tail style	S	s				S	s
7. Antennas	A	a				A	a
8. Spikes	G	H				G	H

	Ocean's Sex Chromosomes		Offspring's Sex Chromosomes		Offspring's Sex	Lucy's Sex Chromosomes	
9. Sex	Heads	Tails	From Ocean	From Lucy		Heads	Tails
	X	Y				X	X

Science and Life Issues Student Sheet 65.1



Analysis Questions:

Inheritance Patterns

1. _____- dominant/recessive pattern discovered by Mendel
   e.g.
2. _____- When heterozygous individuals have a **blend** between dominant and recessive.
   e.g.
3. _____- when heterozygous shows **both** the trait.
   e.g.
4. _____-Trait that is affected by the environment.
   e.g.

Complete the following table for each of the characteristics other than gender.

Characteristics	Type of inheritance (one of the four listed above in your notes)	Explain how you were able to determine the type of inheritance
1. body segment		
2. leg color		
3. eyes (#)		
4.nose length		
5. tail color		
6. tail style		
7. antennas		
8. spikes		

6. Consider the pattern for sex determination.
   a. How is a critter's sex determined?
   b. Whose genetic contribution- Ocean's or Lucy's-determines the sex of the offspring.
7. Who does your critter look most like- Skye, Poppy, Ocean, or Lucy? On which traits did you base your choice?

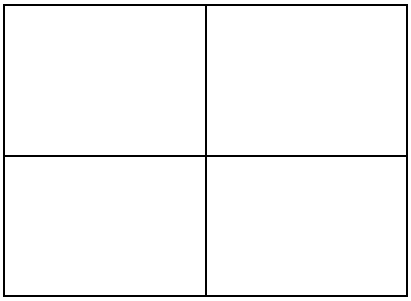
Summary:

1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.and Evidence section)

Putting it all Together: Part A

1. For how many traits is the mother homozygous? _____ The father? ____
2. For how many trait is the mother heterozygous? _____ The father? ____
3. Complete the Punnett Squares below and figure out the genotypes and phenotypes that the offspring might have by filling the in Punnett Squares for each traits.

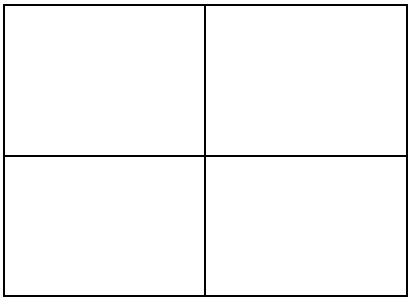
Widow's Peak or Not



Genotypes:

Phenotypes:

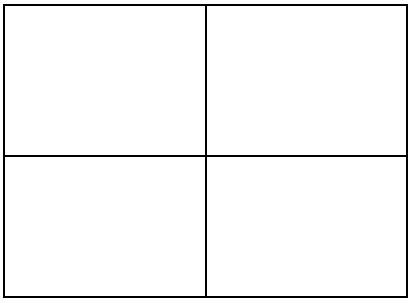
Curley Hair of Straight



Genotypes:

Phenotypes:

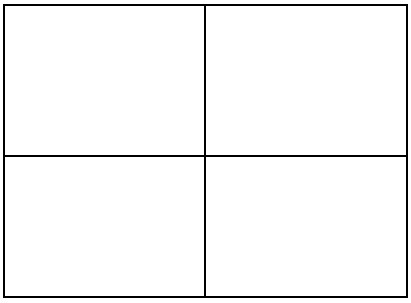
Freckles or No Freckles



Genotypes:

Phenotypes:

Male or Female

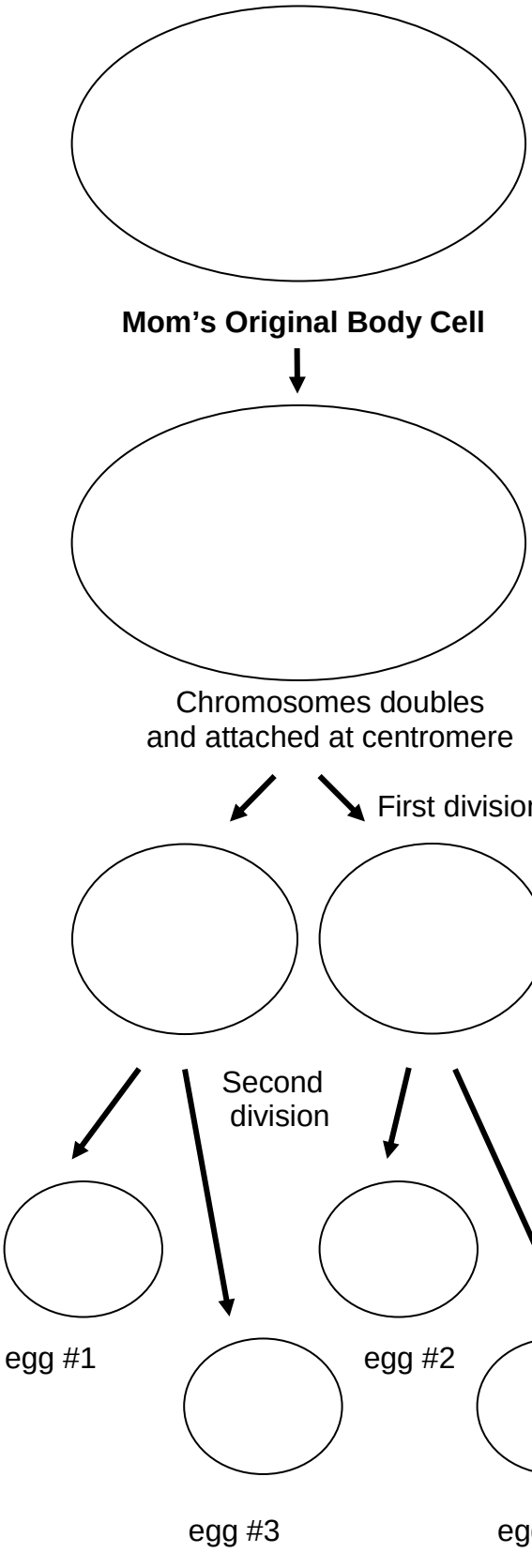


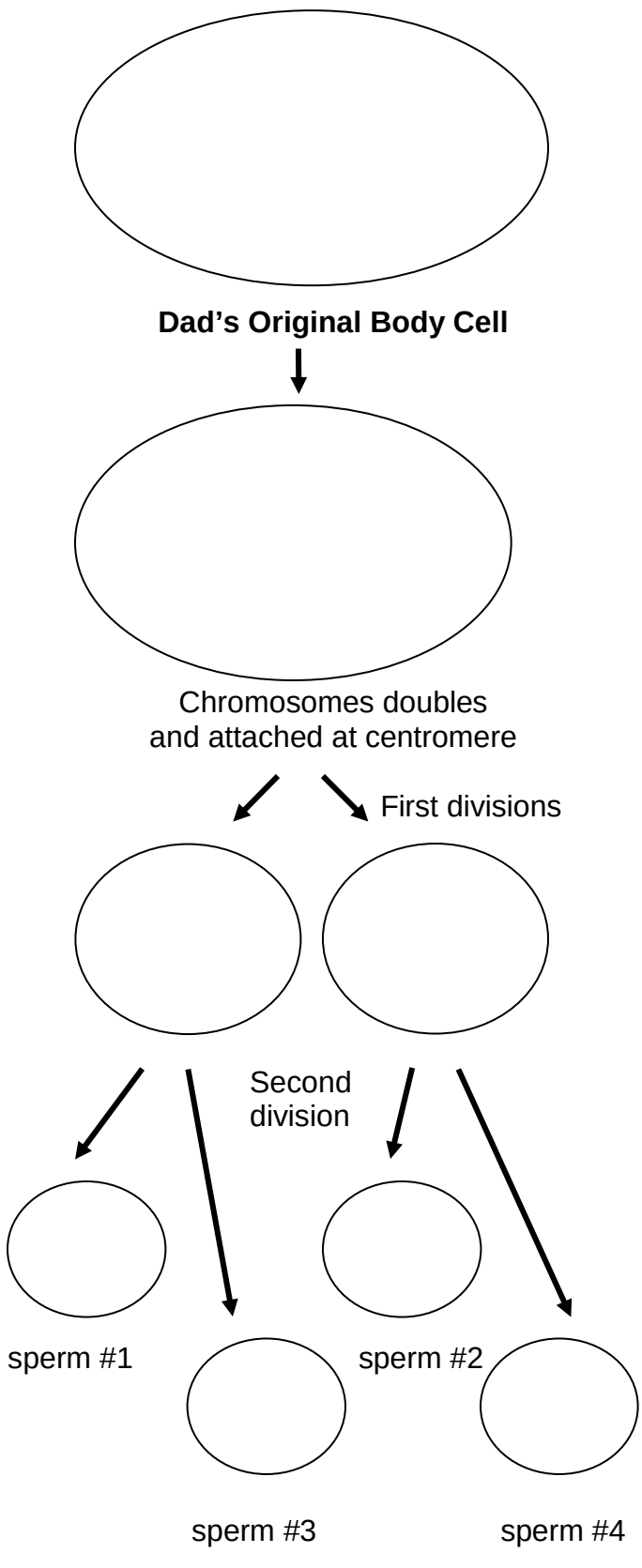
Genotypes:

Phenotypes:

Putting it all Together: Part B

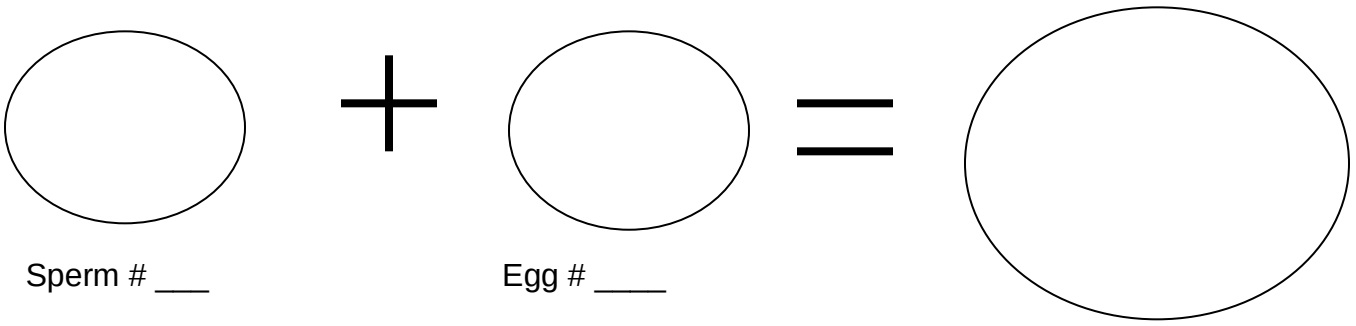
Draw a diagram of each parent cell undergoing meiosis in order to make sex cells. Draw a diagram of the stages of meiosis below by filling in each cell with the appropriate chromosomes. You will start with one body cell and end of four gametes (sperm or egg)





Putting it all Together: Part C

1. Select one egg and one sperm from what you just created. Draw a picture of the egg and the sperm below by copying in the appropriate chromosomes. Then draw what the chromosomes in the fertilized egg would look like.



Sperm # ___ Egg # ____

Fertilized Egg

2. Using the fertilized egg above, fill in the chart below showing the child's genotype and phenotype for the four traits.

Genotype	Phenotype

3. How many child's genotypes are (do not include gender):

Homozygous dominant? ___ Heterozygous? ____ Homozygous recessive? ___

4. How many of the child's phenotypes are dominant? _____ recessive? _____ (do not include gender)

5. Draw a picture of what you child would look like below, name him or her.

Activity 66 Patterns of Pedigree

Challenge Question:

Initial Thoughts:

Evidence:
STT #1a, 1c, 2, 3,4,5 on pg ____

STT #6	Based on these results, figure out the possible allele pairs for each of the four blood types. It may help to make up one or two small pedigrees based upon specific rows of Table 1, using the workspace above.

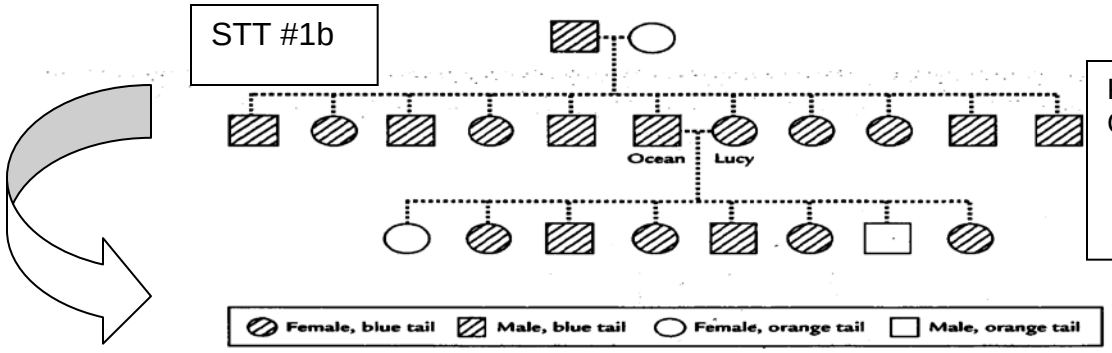
Blood Type	Possible Allele Pairs
O	____
A	____ or ____
B	____ or ____
AB	____

Which allele(s) is/are codominant?

Which allele (s) is/are recessive?

Pedigree Puzzles

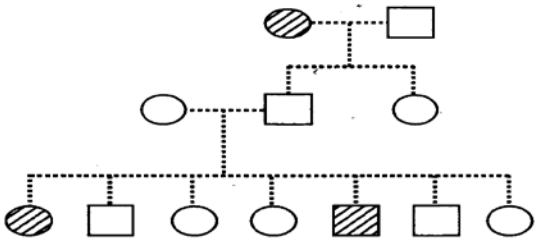
STT #1b



Key
Genotype = Phenotype

Figure 1: Critter Tail-Color Pedigree
This pedigree examines the tail-color trait in the family of critters bred in the zoo.

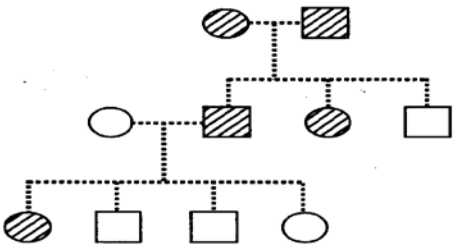
STT #2



Key
Genotype = Phenotype

Figure 2: Family with PKU
Affected individuals are shaded.

STT #4

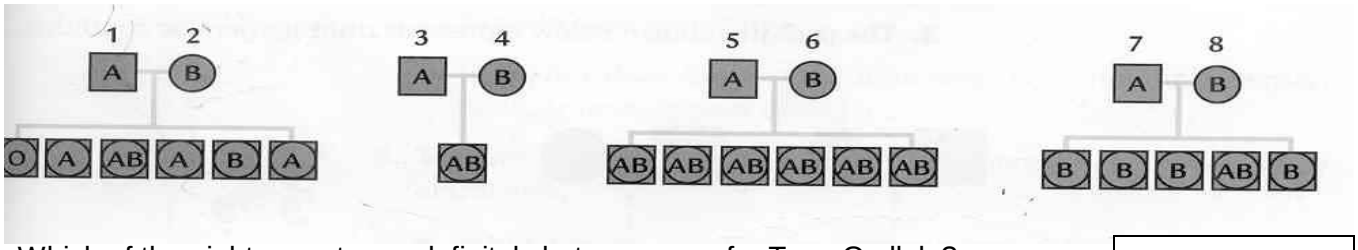


Key
Genotype = Phenotype

Figure 3: Family with Polydactyly
Affected individuals are shaded.

Analysis Questions:

1. The following pedigrees represent the blood types of four unrelated families. In each case, the parents have Type A and Type B blood. **Write out the allele combinations (genotype) for each individual**



a. Which of the eight parents are definitely heterozygous for Type O allele? Explain.

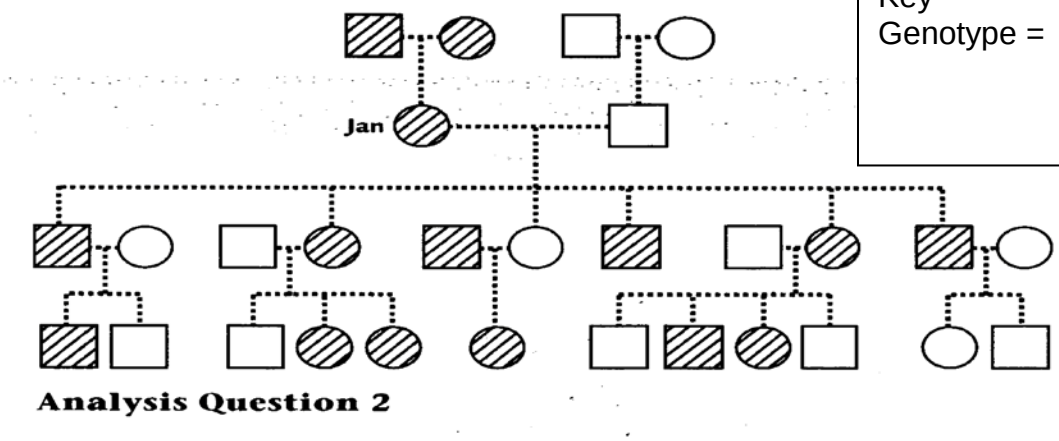
Key:

b. Which of the eight parents are probably not heterozygous for the Type O allele? Explain.

c. Can you be certain that the parent you named in response to Question 1b do not have a Type O allele? Explain.

2. The pedigree shown below represents a genetic condition. Use the information it provides to answer the questions below. **Write out the allele combinations (genotype) for each individual.**

Key
Genotype = Phenotype



Analysis Question 2

a. Is the condition most likely a dominant or recessive trait? Explain your reasoning.

b. Is Jan most likely to be homozygous dominant, heterozygous, or homozygous recessive.

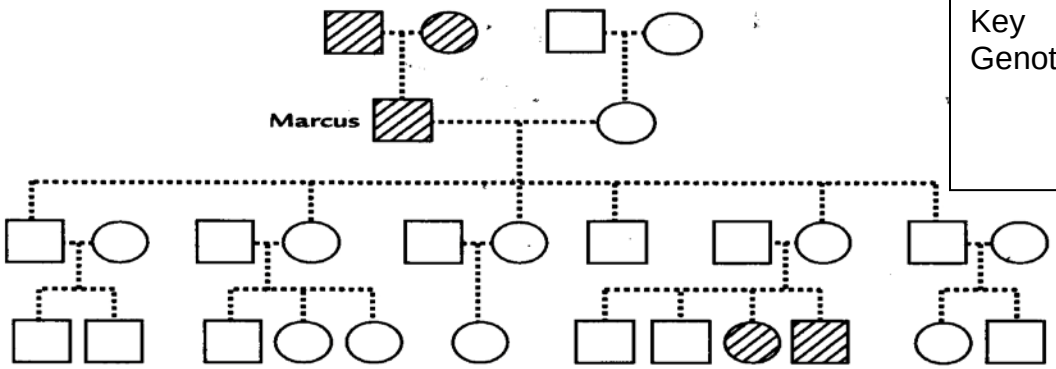
5. The term carrier is used very differently in genetics than in the study of diseases.

a. What is being "carried" by a genetic disorder? What is being "carried" by a disease carrier?

b. How does transmission occur for genetic conditions? How does transmission occur for infectious diseases?

3. The pedigree shown below represents another genetic condition. Use the information it provides to answer the questions below. **Write out the allele combinations (genotype) for each individual.**

Key
Genotype = Phenotype



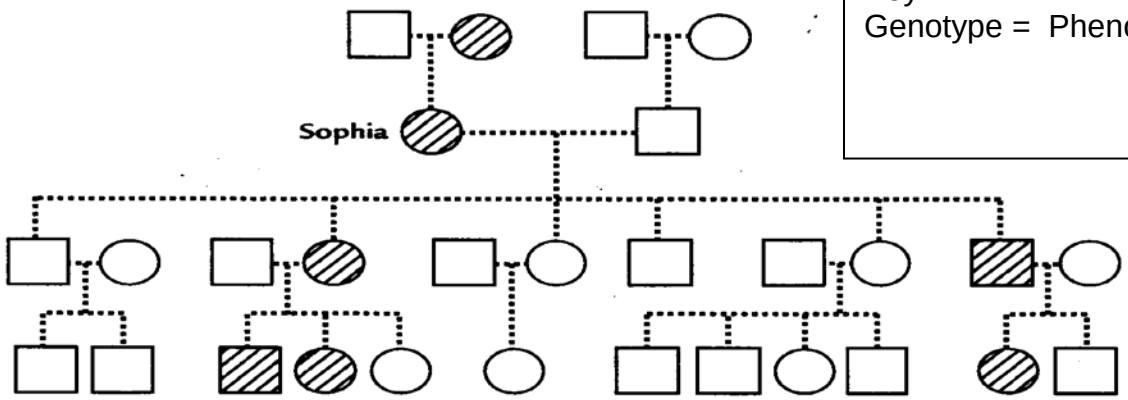
Analysis Question 3

a. Is the condition most likely a dominant or a recessive trait? Explain your reasoning.

b. Is Marcos most likely to be homozygous dominant, heterozygous, or homozygous recessive. Explain your reasoning.

4. The pedigree shown below represents a third genetic condition. Use the information it provides to answer the questions below. **Write out the allele combinations (genotype) for each individual.**

Key
Genotype = Phenotype



Analysis Question 4

a. Is the condition most likely a dominant or a recessive trait. Explain your reasoning.

b. Is Sophia most likely to be homozygous dominant, heterozygous, or homozygous recessive? Explain your reasoning.

Summary:
1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Activity: Build a DNA ladder

Challenge Question: How does the structure of DNA allow for it to be easily copied?

Initial Thoughts:

Evidence:

1. C is always joined to _____ and_____.
2. T is always joined to _____ and _____.
3. G is always joined to _____and _____.
4. A is always joined to _____and _____.

5. C represents _____.
6. T represents_____.
7. G represents_____.
8. A represents_____.
9. D represents_____.
10 P represents_____.

Draw 1 nucleotide here:

DNA Replication

Step 1: DNA _____

Step 2: Nitrogen bases floating in the cytoplasm _____ with the unzipped DNA.

Step 3: Two new DNA strands are formed that have the exact _____ _____.

Step 1:	**Step 2:**	**Step 3:**

DNA Replication Practice:

A A T C C G A G T G G T A A A G A T T A C A G G

_ _

Analysis Questions:

1. Who discovered the structure of DNA? When?
2. How are nitrogen bases attached?
3. How does your DNA act like a blue print?
4. Do different types of cells in your body have different DNA? Explain.
5. Paste your DNA on page ____. Label the following parts: adenine, cytosine, guanine, thymine, phosphate, deoxyribose, hydrogen bonds

Summary:

1. Answer the challenge question again, make sure it is a new or expanded answer.
2. Give examples from the activity to help explain your answer.

Gel Electrophoresis Homework Assignment

Go to: http://gslc.genetics.utah.edu/units/biotech/gel/
Answer the following questions as your work through the simulation.

1. What is your job?
2. How can you sort DNA by size if it too small to see with a microscope?

3. What 2 things can gel electrophoresis be used to separate out?
4. Describe what the gel looks like at a microscopic level.

5. What is at one end of the gel?
6. What gets added to the gel once the DNA strands are in?
7. Describe how different length pieces move through the gel.

8. What must you do to the DNA in the gel before you can view it?
9. What materials do you need to make gel?

10. What is the agarose made from?
11. Why do you add liquid buffer to the agarose?

12. What is at the end of the mold to hold in the agarose?
13. Why do you put the comb in the gel?

14. Why must you add loading bugger to the DNA sample? (2 reasons)

15. In real life, is loading the DNA into gel easy? Explain.

16. What is the purpose of putting the DNA size standard next to the DNA sample?

17. When running electricity through the gel, black = + or – charge and red = + or – charge. (circle – or + for each)
18. What charge is DNA? + or -
19. What proof can you look for to make sure the gel is running?

20. Why does the DNA move?

21. What must you add to the DNA to see it?
22. Can you see single DNA strands?
23. What do you place your gel on in order to view it?

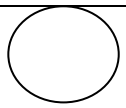
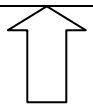
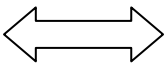
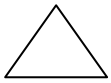
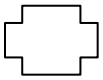
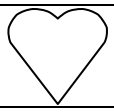
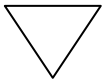
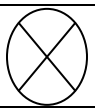
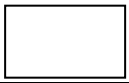
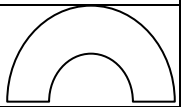
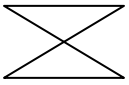
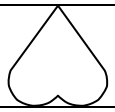
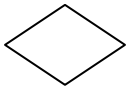
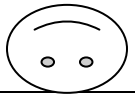
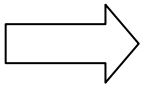
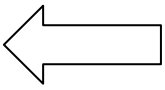
24. What are the units of measurement for DNA? Why does it stand for?

25. What did you estimate your DNA strands to be?
    Top band: _____
    Middle band: _____
    Bottom band: _____

    What was the actual DNA strand lengths?
    Top band: _____
    Middle band: _____
    Bottom band: _____

26. Draw a picture of what the final product of the gel electrophoresis looks on the next lined page in your notebook.

Table 1: mRNA Codons and Matching Amino Acids

AGG 	CGC 	GAC	UGC 
ACU 	CCA 	GGA 	UAC 
ACC 	CUG 	GUC 	UUA 
ACA 	CAG 	GCU 	UCG 
AUA 	CGU 	GUU 	UAU 
AUG 	CCG 	GGC 	UCA 

1.) DNA- ___ ___ ___ ___ ___ ___ ___ ___

mRNA- ___ ___ ___ ___ ___ ___ ___ ___

amino acid sequence- _____ _____ _____ _____ _____ _____ _____ _____

2.) DNA- ___ ___ ___ ___ ___ ___ ___ ___

mRNA- ___ ___ ___ ___ ___ ___ ___ ___

amino acid sequence- _____ _____ _____ _____ _____ _____ _____ _____

3.) DNA- ___ ___ ___ ___ ___ ___ ___ ___

mRNA- ___ ___ ___ ___ ___ ___ ___ ___

amino acid sequence- _____ _____ _____ _____ _____ _____ _____ _____

4.) DNA- ___ ___ ___ ___ ___ ___ ___ ___

mRNA- ___ ___ ___ ___ ___ ___ ___ ___

amino acid sequence- _____ _____ _____ _____ _____ _____ _____ _____

Unit D Vocabulary		
WORD & Descriptive, detailed & COLORED **drawing** explaining the word's definition.	*-Handwritten-* **DEFINITION** (from the SALI book, Prentice Hall textbook, or teacher's website)	Give an **example** of the word in a thoughtful sentence. If an example does not apply, write a thoughtful sentence using the vocabulary word in context (showing that you know its definition).
54 characteristics		
54 traits		
54 genetics		
55 genes		
55 offspring		
55 inherited		
57 asexual reproduction		
57 Sexual reproduction		
57 Fertilization		

57 Clone		
DNA- Nitrogen bases		
DNA- Nucleotide		
59 probability		
59 random		
59 genotype		
59 phenotype		
60 stamen	Anther- Filament-	
60 pistil	Stigma- Style- Ovary-	

0 allele		
60 recessive		
61 homozygous		
61 heterozygous		
63 chromosomes		
63 mutation		
63 meiosis		
PS-Messenger RNA		
PS-Transfer RNA		
PS- Codon		

PS-Anti-codon		
PS-Amino-acid		
PS-Protein		
PS- Transcription		
PS- Translation		
65 “nature vs nurture”		
65 diversity		
65 co-dominance		
65 incomplete dominance		
66 pedigree		